



Sequence Listing created in PatentIn.ST25.txt  
SEQUENCE LISTING

<110> Weigel, Paul H.  
DeAngelis, Paul  
Kumari, Kshama

<120> Hyaluronan Synthase Gene and Uses Thereof

<130> 3554.011

<140> US 09/469,200

<141> 1999-12-21

<150> US 09/178,851

<151> 1998-10-26

<150> US 60/064,435

<151> 1997-10-31

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<170> PatentIn version 3.1

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<212> DNA

<213> Streptococcus equisimilis

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ctgatagctt acctattagt caaaatgtcc ttatcctttt tttacaagcc atttaaggga 180

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gttgacgatg gaagtgctga tgagacaggt attaagcgca ttgaagacta tgtgctgac	360
actggtgacc tatcaagcaa tgtcattgtt catcggtcag agaaaaatca aggaaagcgt	420
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Ser	Leu	Ser	Ile	Tyr	Gly	Phe	Leu	Leu	Ile	Ala	Tyr	Leu	Leu	Val	Lys
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Tyr Lys Val Ala Ala Ile Ile Pro Ser Tyr Asn Glu Asp Ala Glu Ser  
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Leu Leu Glu Thr Leu Lys Ser Val Gln Gln Gln Thr Tyr Pro Leu Ala  
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Glu Ile Tyr Val Val Asp Asp Gly Ser Ala Asp Glu Thr Gly Ile Lys  
100 105 110

Arg Ile Glu Asp Tyr Val Arg Asp Thr Gly Asp Leu Ser Ser Asn Val  
115 120 125

Ile Val His Arg Ser Glu Lys Asn Gln Gly Lys Arg His Ala Gln Ala  
130 135 140

Trp Ala Phe Glu Arg Ser Asp Ala Asp Val Phe Leu Thr Val Asp Ser  
145 150 155 160

Asp Thr Tyr Ile Tyr Pro Asp Ala Leu Glu Glu Leu Leu Lys Thr Phe  
165 170 175

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180 185 190

Arg Gln Thr Asn Leu Leu Thr Arg Leu Thr Asp Ile Arg Tyr Asp Asn  
195 200 205

Ala Phe Gly Val Glu Arg Ala Ala Gln Ser Val Thr Gly Asn Ile Leu  
210 215 220

Val Cys Ser Gly Pro Leu Ser Val Tyr Arg Arg Glu Val Val Val Pro  
225 230 235 240

Asn Ile Asp Arg Tyr Ile Asn Gln Thr Phe Leu Gly Ile Pro Val Ser  
245 250 255

Ile Gly Asp Asp Arg Cys Leu Thr Asn Tyr Ala Thr Asp Leu Gly Lys  
260 265 270

Thr Val Tyr Gln Ser Thr Ala Lys Cys Ile Thr Asp Val Pro Asp Lys  
275 280 285

Met Ser Thr Tyr Leu Lys Gln Gln Asn Arg Trp Asn Lys Ser Phe Phe  
290 295 300

Arg Glu Ser Ile Ile Ser Val Lys Lys Ile Met Asn Asn Pro Phe Val  
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310

315

320

Ala Leu Trp Thr Ile Leu Glu Val Ser Met Phe Met Met Leu Val Tyr  
325 330 335

Ser Val Val Asp Phe Phe Val Gly Asn Val Arg Glu Phe Asp Trp Leu  
340 345 350

Arg Val Leu Ala Phe Leu Val Ile Ile Phe Ile Val Ala Leu Cys Arg  
355 360 365

Asn Ile His Tyr Met Leu Lys His Pro Leu Ser Phe Leu Leu Ser Pro  
370 375 380

Phe Tyr Gly Val Leu His Leu Phe Val Leu Gln Pro Leu Lys Leu Tyr  
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<213> Artificial sequence

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Sequence Listing created in PatentIn.ST25.txt

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<211> 1740

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Sequence Listing created in PatentIn.ST25.txt

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<211> 2937

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<213> *Pastuerella Multocida*

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Sequence Listing created in PatentIn.ST25.txt

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<212> PRT

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Lys	Ile	Val	Glu	Phe	Gln	Ile	Thr	Lys	Cys	Lys	Glu	Lys	Leu	Ser	Ala
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Val	Asn	Val	Cys	Asp	Ser	Pro	Leu	Asp	Ile	Ala	Thr	Gln	Leu	Leu	Leu
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Ser Asn Val Lys Lys Leu Val Leu Ser Asp Ser Glu Lys Asn Thr Leu  
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Lys Asn Lys Trp Lys Leu Leu Thr Glu Lys Lys Ser Glu Asn Ala Glu  
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Val Arg Ala Val Ala Leu Val Pro Lys Asp Phe Pro Lys Asp Leu Val  
115 120 125

Leu Ala Pro Leu Pro Asp His Val Asn Asp Phe Thr Trp Tyr Lys Lys  
130 135 140

Arg Lys Lys Arg Leu Gly Ile Lys Pro Glu His Gln His Val Gly Leu  
145 150 155 160

Ser Ile Ile Val Thr Thr Phe Asn Arg Pro Ala Ile Leu Ser Ile Thr  
165 170 175

Leu Ala Cys Leu Val Asn Gln Lys Thr His Tyr Pro Phe Glu Val Ile  
180 185 190

Val Thr Asp Asp Gly Ser Gln Glu Asp Leu Ser Pro Ile Ile Arg Gln  
195 200 205

Tyr Glu Asn Lys Leu Asp Ile Arg Tyr Val Arg Gln Lys Asp Asn Gly  
210 215 220

Phe Gln Ala Ser Ala Ala Arg Asn Met Gly Leu Arg Leu Ala Lys Tyr  
225 230 235 240

Asp Phe Ile Gly Leu Leu Asp Cys Asp Met Ala Pro Asn Pro Leu Trp  
245 250 255

Val His Ser Tyr Val Ala Glu Leu Leu Glu Asp Asp Asp Leu Thr Ile  
260 265 270

Ile Gly Pro Arg Lys Tyr Ile Asp Thr Gln His Ile Asp Pro Lys Asp  
275 280 285

Phe Leu Asn Asn Ala Ser Leu Leu Glu Ser Leu Pro Glu Val Lys Thr  
290 295 300

Asn Asn Ser Val Ala Ala Lys Gly Glu Gly Thr Val Ser Leu Asp Trp  
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Arg Leu Glu Gln Phe Glu Lys Thr Glu Asn Leu Arg Leu Ser Asp Ser  
325 330 335

Sequence Listing created in PatentIn.ST25.txt

Pro Phe Arg Phe Phe Ala Ala Gly Asn Val Ala Phe Ala Lys Lys Trp  
340 345 350

Leu Asn Lys Ser Gly Phe Phe Asp Glu Glu Phe Asn His Trp Gly Gly  
355 360 365

Glu Asp Val Glu Phe Gly Tyr Arg Leu Phe Arg Tyr Gly Ser Phe Phe  
370 375 380

Lys Thr Ile Asp Gly Ile Met Ala Tyr His Gln Glu Pro Pro Gly Lys  
385 390 395 400

Glu Asn Glu Thr Asp Arg Glu Ala Gly Lys Asn Ile Thr Leu Asp Ile  
405 410 415

Met Arg Glu Lys Val Pro Tyr Ile Tyr Arg Lys Leu Leu Pro Ile Glu  
420 425 430

Asp Ser His Ile Asn Arg Val Pro Leu Val Ser Ile Tyr Ile Pro Ala  
435 440 445

Tyr Asn Cys Ala Asn Tyr Ile Gln Arg Cys Val Asp Ser Ala Leu Asn  
450 455 460

Gln Thr Val Val Asp Leu Glu Val Cys Ile Cys Asn Asp Gly Ser Thr  
465 470 475 480

Asp Asn Thr Leu Glu Val Ile Asn Lys Leu Tyr Gly Asn Asn Pro Arg  
485 490 495

Val Arg Ile Met Ser Lys Pro Asn Gly Gly Ile Ala Ser Ala Ser Asn  
500 505 510

Ala Ala Val Ser Phe Ala Lys Gly Tyr Tyr Ile Gly Gln Leu Asp Ser  
515 520 525

Asp Asp Tyr Leu Glu Pro Asp Ala Val Glu Leu Cys Leu Lys Glu Phe  
530 535 540

Leu Lys Asp Lys Thr Leu Ala Cys Val Tyr Thr Thr Asn Arg Asn Val  
545 550 555 560

Asn Pro Asp Gly Ser Leu Ile Ala Asn Gly Tyr Asn Trp Pro Glu Phe  
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Ser Arg Glu Lys Leu Thr Thr Ala Met Ile Ala His His Phe Arg Met  
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Sequence Listing created in PatentIn.ST25.txt

Phe Thr Ile Arg Ala Trp His Leu Thr Asp Gly Phe Asn Glu Lys Ile  
595 600 605

Glu Asn Ala Val Asp Tyr Asp Met Phe Leu Lys Leu Ser Glu Val Gly  
610 615 620

Lys Phe Lys His Leu Asn Lys Ile Cys Tyr Asn Arg Val Leu His Gly  
625 630 635 640

Asp Asn Thr Ser Ile Lys Lys Leu Gly Ile Gln Lys Lys Asn His Phe  
645 650 655

Val Val Val Asn Gln Ser Leu Asn Arg Gln Gly Ile Thr Tyr Tyr Asn  
660 665 670

Tyr Asp Glu Phe Asp Asp Leu Asp Glu Ser Arg Lys Tyr Ile Phe Asn  
675 680 685

Lys Thr Ala Glu Tyr Gln Glu Glu Ile Asp Ile Leu Lys Asp Ile Lys  
690 695 700

Ile Ile Gln Asn Lys Asp Ala Lys Ile Ala Val Ser Ile Phe Tyr Pro  
705 710 715 720

Asn Thr Leu Asn Gly Leu Val Lys Lys Leu Asn Asn Ile Ile Glu Tyr  
725 730 735

Asn Lys Asn Ile Phe Val Ile Val Leu His Val Asp Lys Asn His Leu  
740 745 750

Thr Pro Asp Ile Lys Lys Glu Ile Leu Ala Phe Tyr His Lys His Gln  
755 760 765

Val Asn Ile Leu Leu Asn Asn Asp Ile Ser Tyr Tyr Thr Ser Asn Arg  
770 775 780

Leu Ile Lys Thr Glu Ala His Leu Ser Asn Ile Asn Lys Leu Ser Gln  
785 790 795 800

Leu Asn Leu Asn Cys Glu Tyr Ile Ile Phe Asp Asn His Asp Ser Leu  
805 810 815

Phe Val Lys Asn Asp Ser Tyr Ala Tyr Met Lys Lys Tyr Asp Val Gly  
820 825 830

Met Asn Phe Ser Ala Leu Thr His Asp Trp Ile Glu Lys Ile Asn Ala  
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835

840

845

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Tyr Ala Leu Ala His Glu Leu Leu Thr Ile Ile Lys Glu Val Ile Thr  
885 890 895

Ser Cys Gln Ser Ile Asp Ser Val Pro Glu Tyr Asn Thr Glu Asp Ile  
900 905 910

Trp Phe Gln Phe Ala Leu Leu Ile Leu Glu Lys Lys Thr Gly His Val  
915 920 925

Phe Asn Lys Thr Ser Thr Leu Thr Tyr Met Pro Trp Glu Arg Lys Leu  
930 935 940

Gln Trp Thr Asn Glu Gln Ile Glu Ser Ala Lys Arg Gly Glu Asn Ile  
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<210> 10

<211> 568

<212> PRT

<213> Paramecium bursaria chorella virus

<400> 10

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Ile Thr Gly Tyr Val Leu His Trp Asn Ile Ala Leu Ser Thr Ile Trp  
35 40 45

Gly Val Ser Ala Tyr Gly Ile Phe Val Phe Gly Phe Phe Leu Ala Gln  
50 55 60

Sequence Listing created in PatentIn.ST25.txt

Val Leu Phe Ser Glu Leu Asn Arg Lys Arg Leu Arg Lys Trp Ile Ser  
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Leu Arg Pro Lys Gly Trp Asn Asp Val Arg Leu Ala Val Ile Ile Ala  
85 90 95

Gly Tyr Arg Glu Asp Pro Tyr Met Phe Gln Lys Cys Leu Glu Ser Val  
100 105 110

Arg Asp Ser Asp Tyr Gly Asn Val Ala Arg Leu Ile Cys Val Ile Asp  
115 120 125

Gly Asp Glu Asp Asp Asp Met Arg Met Ala Ala Val Tyr Lys Ala Ile  
130 135 140

Tyr Asn Asp Asn Ile Lys Lys Pro Glu Phe Val Leu Cys Glu Ser Asp  
145 150 155 160

Asp Lys Glu Gly Glu Arg Ile Asp Ser Asp Phe Ser Arg Asp Ile Cys  
165 170 175

Val Leu Gln Pro His Arg Gly Lys Arg Glu Cys Leu Tyr Thr Gly Phe  
180 185 190

Gln Leu Ala Lys Met Asp Pro Ser Val Asn Ala Val Val Leu Ile Asp  
195 200 205

Ser Asp Thr Val Leu Glu Lys Asp Ala Ile Leu Glu Val Val Tyr Pro  
210 215 220

Leu Ala Cys Asp Pro Glu Ile Gln Ala Val Ala Gly Glu Cys Lys Ile  
225 230 235 240

Trp Asn Thr Asp Thr Leu Leu Ser Leu Leu Val Ala Trp Arg Tyr Tyr  
245 250 255

Ser Ala Phe Cys Val Glu Arg Ser Ala Gln Ser Phe Phe Arg Thr Val  
260 265 270

Gln Cys Val Gly Gly Pro Leu Gly Ala Tyr Lys Ile Asp Ile Ile Lys  
275 280 285

Glu Ile Lys Asp Pro Trp Ile Ser Gln Arg Phe Leu Gly Gln Lys Cys  
290 295 300

Thr Tyr Gly Asp Asp Arg Arg Leu Thr Asn Glu Ile Leu Met Arg Gly  
305 310 315 320

Sequence Listing created in PatentIn.ST25.txt

Lys Lys Val Val Phe Thr Pro Phe Ala Val Gly Trp Ser Asp Ser Pro  
325 330 335

Thr Asn Val Phe Arg Tyr Ile Val Gln Gln Thr Arg Trp Ser Lys Ser  
340 345 350

Trp Cys Arg Glu Ile Trp Tyr Thr Leu Phe Ala Ala Trp Lys His Gly  
355 360 365

Leu Ser Gly Ile Trp Leu Ala Phe Glu Cys Leu Tyr Gln Ile Thr Tyr  
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Phe Phe Leu Val Ile Tyr Leu Phe Ser Arg Leu Ala Val Glu Ala Asp  
385 390 395 400

Pro Arg Ala Gln Thr Ala Thr Val Ile Val Ser Thr Thr Val Ala Leu  
405 410 415

Ile Lys Cys Gly Tyr Phe Ser Phe Arg Ala Lys Asp Ile Arg Ala Phe  
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Tyr Phe Val Leu Tyr Thr Phe Val Tyr Phe Phe Cys Met Ile Pro Ala  
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Gly Gly Asn Glu Lys Pro Ser Val Gly Thr Arg Val Ala Leu Trp Ala  
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Lys Gln Tyr Leu Ile Ala Tyr Met Trp Trp Ala Ala Val Val Gly Ala  
485 490 495

Gly Val Tyr Ser Ile Val His Asn Trp Met Phe Asp Trp Asn Ser Leu  
500 505 510

Ser Tyr Arg Phe Ala Leu Val Gly Ile Cys Ser Tyr Ile Val Phe Ile  
515 520 525

Val Ile Val Leu Val Val Tyr Phe Thr Gly Lys Ile Thr Thr Trp Asn  
530 535 540

Phe Thr Lys Leu Gln Lys Glu Leu Ile Glu Asp Arg Val Leu Tyr Asp  
545 550 555 560

Ala Thr Thr Asn Ala Gln Ser Val  
565

Sequence Listing created in PatentIn.ST25.txt

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conclude